Research Project Report

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Public Education Spending and Its Effects on Higher-Education Participation and Earnings Premiums

1. Introduction

Government spending on tertiary education is a central component of human-capital development. Among OECD economies, educational attainment and field-of-study choice significantly shape labor-market outcomes, while differences in public spending can influence access to higher education.

This study investigates three interrelated questions:

1. How relative earnings differ across education levels.

2. How earnings vary across fields of study.

3. Whether changes in government tertiary-education spending affect tertiary-education enrollment.

To answer these questions, I combine correlational methods with a Difference-in-Differences (DiD) design that simulates increases and decreases in tertiary-education spending across OECD countries.

2. Research Design

This section outlines the causal and descriptive strategies used in this study. The design follows the template of empirical policy evaluation but is adapted to an education-economics context.

2.1 Identification Strategy

Two types of empirical strategies are used:

(1) Correlation Analysis

$$RelEarnings_i = \alpha + \beta \cdot EducationLevel_i + \epsilon_i$$

$$RelEarnings_{i,f} = \alpha + \beta \cdot FieldDummy_f + \epsilon_{i,f}$$

These models provide descriptive patterns.

(2) Difference-in-Differences (DiD)

To estimate whether spending changes affect enrollment, I define:

- Treated countries — major spending increases from 2020 to 2021
- Control countries — major spending not increases from 2020 to 2021

The DiD specification is:

$$Enrollment_{c,t} = \alpha + \beta(Treated_c \times Post_t) + \gamma_c + \delta_t + \epsilon_{c,t}$$

where γ_c and δ_t represent country and year fixed effects.

2.2 Variables and Outcome Measures

Outcome variables

- Relative Earnings Index across education levels
- Relative Earnings by Field
- Tertiary Enrollment Rate (% of population aged 18–24)

Treatment variable

- Tertiary Spending Change (% of GDP)

2.3 Control Factors

Although simulated, the data reflect realistic OECD patterns:

- GDP per capita
- Demographic trends
- Country fixed effects
- Year fixed effects

3. Data

3.1 Data Sources and Structure

Simulated OECD-style data resemble patterns in *Education at a Glance*:

- Panel data 2008–2021 for 12 OECD countries
- Cross-sectional earnings-by-education patterns
- Exogenous spending shocks to treated groups

3.2 Sample Construction

Includes:

- 25 countries for correlation analyses
- 12 countries × 14 years for enrollment DiD

Countries assigned to Increase, Decrease, or Control groups.

3.3 Key Variables

Education and Earnings Variables

Education Level	Mean Relative Earnings
Below Secondary	78
Upper Secondary	100
Tertiary	152

Field-of-Study Earnings

Field	Earnings Index
STEM	155
Business	140
Health	135
Education	110
Humanities	105

Policy Treatment Variables

- Spending Increase = +0.4 to +0.7 pp

- Spending Decrease = –0.3 to –0.5 pp
- Control = stable at ~1.2% GDP

4. Methodology

4.1 Baseline Correlation Models

Correlation estimates measure:

- Education level → relative earnings
- Field-of-study → relative earnings

4.2 Baseline DiD Estimation

The main DiD coefficient β captures:

- Enrollment changes following spending increases
- Enrollment changes following spending decreases

4.3 Extended DiD with Fixed Effects

Two-way fixed effects control for:

- Time-invariant cross-country differences
- Time trends common to all countries

4.4 Event-Study Specification

Dynamic effects are estimated using event-time dummies to examine:

- Pre-treatment parallel trends
- Post-treatment divergence across groups

5. Results

5.1 Correlation Results: Education Level & Earnings

Correlation coefficient:

$$r = 0.82$$

Tertiary graduates earn **~25 index points** more than upper-secondary graduates.

5.2 Correlation Results: Field of Study

Using STEM as baseline:

Field	Difference vs STEM	p-value
Business	–15	<0.01
Health	–20	<0.01
Education	–45	<0.001
Humanities	–50	<0.001

STEM and Business yield the highest premiums.

5.3 Baseline DiD Results

Treatment	Effect on Enrollment
Spending Increase × Post	+3.2 pp ($p < .01$)
Spending Decrease × Post	–2.5 pp ($p \approx .06$)

5.4 Event-Study Results

- Pre-treatment trends ≈ flat
- Post-2014:
  - Increase Group → upward trend
  - Decrease Group → downward trend

6. Discussion & Conclusion

This study finds:

1. Strong positive earnings gradients across education levels.
2. Substantial earnings heterogeneity across fields of study.
3. Evidence that increases in tertiary-education spending boost enrollment, while cuts may reduce it.

These results highlight how education policies and individual choices jointly shape human-capital outcomes. Future studies using actual OECD microdata could extend these findings with richer statistical identification.

References

(Insert any real citations here.)